

REMARKS

Claims 2-4 and 6-10 are currently pending, of which claims 2 and 8-10 have been amended. No new claims have been added. Applicant respectfully believes that no new matter has been introduced. Claims 6 and 7 stand withdrawn from further consideration.

Claims 3/10, 4/10, and 10:

In the Office Action mailed May 28, 2004, the Examiner has taken the position that the following claims are directed to a non-elected species and should be withdrawn from further consideration: claims 3/10, 4/10, and 10.

Applicant respectfully traverses the Examiner's position regarding claims 3/10, 4/10, and 10.

Claim 10 has been amended herein to further clarify the present claimed invention. Claim 10, as amended, sets forth "a container having an interior space defined by a surface of revolution" in combination with other claimed features. Claim 10, as amended, is directed to the elected species corresponding to Figure 3.

Thus, in view of the foregoing, Applicant respectfully submits that claims 3/10, 4/10, and 10, as amended, should not be withdrawn from further consideration.

Claims 2, 3/2, 4/2, 8, and 9:

Claims 2, 3/2, 4/2, 8, and 9 stand rejected under the first paragraph of 35 USC 112, as failing to comply with the written description requirement.

Applicant respectfully traverses the above rejection of claims 2, 3/2, 4/2, 8, and 9.

Claims 2, 8, and 9 have been amended to further clarify the present claimed invention. Claims 2, 3/2, 4/2, 8, and 9, as amended, are respectfully believed to comply with the first paragraph of 35 USC 112.

As illustrated in Figure 3, liquid inlet 20 guides liquid “directly” to space 10. In other words, liquid from liquid inlet 20 directly impinges on space 10. “Direct impingement” is called for by the structure illustrated in Figure 3.

Figure 1(a) depicts gas cavity V in a string-like shape, and shows that liquid inlet 2 causes liquid to directly impinge on portion 100. According to the disclosure of the present invention, a “direct impingement” is called for because the swirling gas cavity is described as being “forcibly cut off and smashed” .

Claim 2, as amended, sets forth “to generate a swirling gas that is forcibly cut off and smashed by direct impingement by swirling pressurized liquid” in combination with the other claimed features.

Claim 8, as amended, sets forth “generating micro-bubbles by forcibly cutting off and smashing the swirling gas cavity with swirling pressurized liquid” in combination with the other claimed features.

Claim 9, as amended, sets forth “continuously cutting off and smashing the swirling gas cavity” in combination with the other claimed features.

Thus, in view of the foregoing, Applicant respectfully submits that the rejection of claims 2, 3/2, 4/2, 8, and 9 should be withdrawn.

Brief Review of Aspects of the Present Invention:

Before turning to the cited art, a brief review of the present invention is in order. The present invention relates to micro-bubble generating system, comprising a container main unit, a liquid inlet, a gas inlet, and related features. As illustrated in Figure 1(a), gas is sucked through the gas introducing hole 4 into space 1, a swirling gas cavity V is generated, and liquid is guided through liquid inlet 2 directly toward portion 100. As shown in Fig. 3, gas is sucked through gas hole 40 into space 10, and liquid is introduced into space 10 through liquid inlet 20.

In view of the foregoing, the swirling gas is directly impinged by the liquid, and the swirling gas is forcibly cut off and smashed by the liquid, in accordance with the principles of the present invention.

Claims 2-4, 8, and 9:

- (a) Claims 2, 8, and 9 stand rejected under 35 USC 102(b) as anticipated by USP 2,653,801 (**Fontein**).
- (b) Claims 3/2, 4/2, 8, and 9 stand rejected under 35 USC 103(a) as obvious over **Fontein**.

Applicant respectfully traverses the above rejections of claims 2-4, 8, and 9.

The Examiner cites and relies upon the following drawings of **Fontein**: Figures 1, 2, 4a, and 4b. Figure 1 of **Fontein** shows that the walls of the suction pipe 8 extend all the way down to a position disposed between feed aperture 2 and an interior region of suction pipe 8. Thus, there is a physical barrier located between feed aperture 2 and the interior region of suction pipe 8. In the configuration disclosed by Figure 1 of **Fontein**, material that travels through feed pipe 1 and feed aperture 2 cannot “forcibly cut off and smash” swirling gas, in accordance with the principles of the present invention. Furthermore, in the configuration disclosed by Figure 1 of **Fontein**, material that travels through feed pipe 1 and feed aperture 2 cannot “directly impinge” on swirling gas, in accordance with the principles of the present invention.

Figure 2 of **Fontein** shows that the walls of the nozzle 9 extend all the way up to a position disposed between feed aperture 2a and an interior region of nozzle 9. Thus, there is a physical barrier located between feed aperture 2a and the interior region of nozzle 9. In the configuration disclosed by Figure 2 of **Fontein**, material that travels through feed pipe 1a and feed aperture 2a cannot “forcibly cut off and smash” swirling gas, in accordance with the principles of the present invention. Furthermore, in the configuration disclosed by Figure 2 of **Fontein**, material that travels through feed pipe 1a and feed aperture 2a cannot “directly impinge” on swirling gas, in accordance with the principles of the present invention.

Figures 4a and 4b of **Fontein** show that the walls of the nozzle 9b extend all the way over to a position disposed between feed aperture 2b and an interior region of nozzle 9b. Thus, there is a physical barrier located between feed aperture 2b and the interior region of nozzle 9b. In the configuration disclosed by Figures 4a and 4b of **Fontein**, material that travels through feed pipe 1b and feed aperture 2b cannot “forcibly cut off and smash” swirling gas, in accordance with the principles of the present invention. Furthermore, in the configuration disclosed by Figures 4a and 4b of **Fontein**, material that travels through feed pipe 1b and feed aperture 2b cannot “directly impinge” on swirling gas, in accordance with the principles of the present invention.

Fontein fails to describe, teach, or suggest the following features of claim 2, as amended:
“a gas introducing hole opening at one end of said frusto-conical space to generate a swirling gas that

is forcibly cut off and smashed by direct impingement by swirling pressurized liquid introduced through said liquid inlet” in combination with the other claimed features.

Fontein fails to describe, teach, or suggest the following features of claim 8, as amended:
“generating micro-bubbles by forcibly cutting off and smashing the swirling gas cavity with swirling pressurized liquid to generate a difference of swirling velocity between the gas and liquid portions in the swirling gas cavity” in combination with the other claimed features.

Fontein fails to describe, teach, or suggest the following features of claim 9, as amended:
“generating micro-bubbles by forcibly cutting off and directly impinging the swirling gas cavity with swirling pressurized liquid to generate a difference of swirling velocity between the portions in the swirling gas cavity” in combination with the other claimed features.

Thus, Applicant respectfully submits that the rejections of claims 2-4, 8, and 9 should be withdrawn.

Claim 10:

Applicant respectfully submits that claim 10, as amended, sets forth features not described, taught, or suggested by **Fontein**.

Fontein fails to describe, teach, or suggest the following features of claim 10, as amended:
“wherein said swirling pressurized liquid introduced through said pressurized liquid inlet directly impinges on said narrow swirling gas flow stream” in combination with the other claimed features.

Thus, Applicant respectfully submits that claim 10, as amended, is in condition for allowance.

In view of the aforementioned amendments and accompanying remarks, claims 2-4 and 8-10, as amended, are believed to be in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 09/743,531
Reply to Office Action dated May 28, 2004

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP

Sharon R. Chen (REG. NO. 37,806)

for John F. Carney
Attorney for Applicant
Reg. No. 20,276

JFC/DRC/nrp
Atty. Docket No. 010006
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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